BJ21

Schwalbe Service & Versand GmbH

Zentralwerkstatt und Ersatzteildepot für ORION- und ISP-Produkte

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Service Manual

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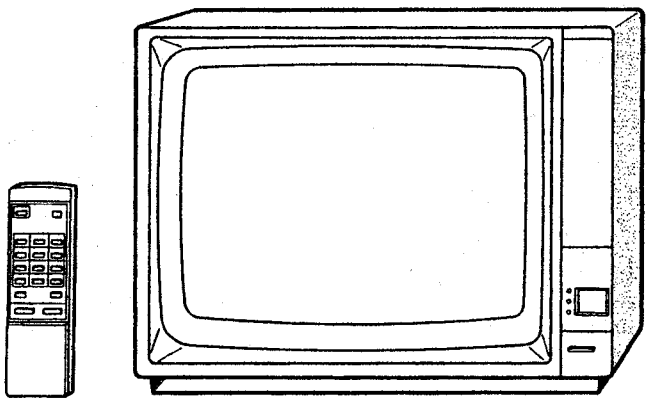
COLOR TELEVISION RECEIVER

KabelTV

PAL/SECAM

ORION

COLOR 4288 RC



Bei technischen Änderungen können Ergänzungsblätter angefordert werden.

MFR'S VERSION

MFR'S VERSION B

SL-Druck GmbH

Specifications are subject to change without notice.

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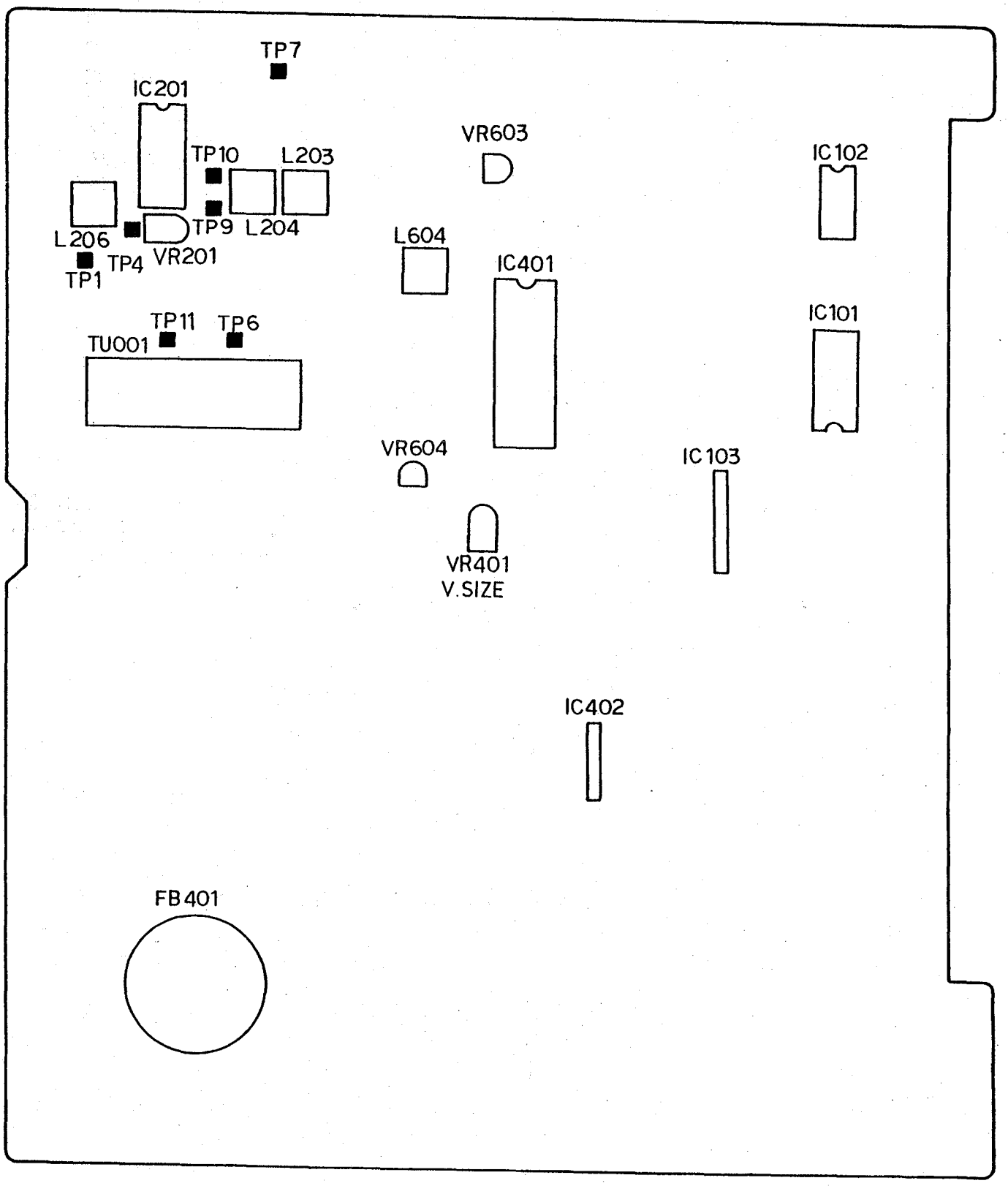
SPECIFICATIONS

PICTURE SIZE		16 inch
SYSTEM		PAL/SECAM
FREQUENCY RANGE	VHF(L)	2 - 4, X - S2 ch, 47 - 118 MHz
	VHF(H)	S3 - S10, 5 - 12, S11 - S20 ch 118 - 300 MHz
	UHF	21 - 69 ch, 470 - 862 MHz
MAXIMUM SENSITIVITY	VHF	20 dB
	UHF	25 dB
INTERMEDIATE FREQUENCY:		
Picture IF Carrier Frequency		38.9 MHz
Color Sub Carrier Frequency		34.47 MHz
Sound IF Carrier Frequency		33.4 MHz
SOUND INTERMEDIATE FREQUENCY		5.5 MHz
MAXIMUM OUTPUT POWER		2.0 W
10% THD OUTPUT POWER		1.8 W
SPEAKER		8 ohm
POWER SOURCE		AC 220V

IMPORTANT
FOR SERVICE WORK ALWAYS USE MAINS ISOLATING TRANSFORMER, CHASSIS IS LIVE.
(IRRESPECTIVE OF POLARITY OF MAINS PLUG.)

MAJOR COMPONENTS LOCATION GUIDE



ALIGNMENT INSTRUCTIONS

SHUT DOWN CIRCUIT

When the high voltage rises, a simultaneous voltage increase will develop at terminal 9 of the Horizontal Output Transformer(FB401), and be applied to pin 26 of IC401. If excessive high voltage is produced, the increased voltage developed exceeds the rating of zener diode D404 causing the Horizontal Oscillator to stop functioning and the high voltage system is then shut down.

VERTICAL SIZE ADJUSTMENT

Adjust the control **(VR401)** so that the picture fills the picture opening from top to bottom and is proportionate to the width.

RF AGC ADJUSTMENT

The RF AGC control is adjusted at the factory and rarely requires re-adjustment unless the received picture exhibits too much snow or the receiver lacks sensitivity. Home adjustment can be made by tuning in a weak snowy station and adjusting RF AGC for the least amount of snow. For a more accurate adjustment use the following procedure.

1. Receive the signal of test pattern (80dB).
2. Adjust AGC pin of TV tuner (TP11) to 3.2V with **VR201** control.

SUB BRIGHT ADJUSTMENT

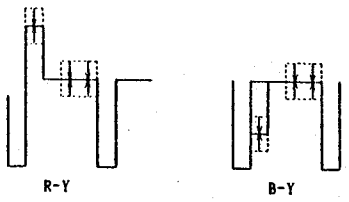
1. Receive the signal of Monochrom pattern.
2. Set the Contrast (VR101-2) control to maximum position.
3. Set the Brightness (VR101-1) control to minimum position.
4. Adjust the Sub Bright **(VR605)** control to obtain a dim white pattern on 75% of gray scale.

FOCUS ADJUSTMENT

Adjust focus control, on the flyback transformer, for fine picture.

HUE DELAY ADJUSTMENT

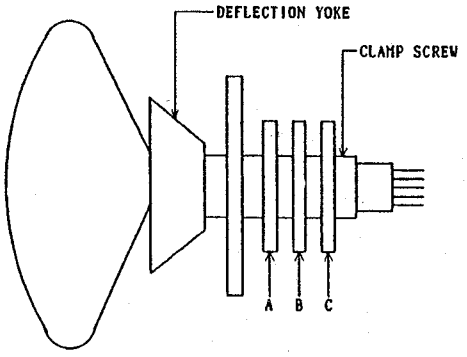
1. Receive the signal of DEM pattern.
2. Connect dual oscilloscope to Base of Q801 and Q803.
3. Set the color (VR101-3) control to maximum position.
4. Adjust waveform to straight line with **VR603, VR604** and **L604.**



COLOR PURITY ADJUSTMENT

The receiver must have been operating 10 minutes prior to this procedure and the face plate of the CRT must be at room temperature. The following procedure is ecommended while using a Dot/Bar Generator.

1. Check for correct location of all neck components. **(Refer to Figure 1)**
2. Rough-in the static convergence at the center of the CRT, as explained in the static convergence.
3. Rotate the contrast control to maximum CCW position and rotate brightness control as far CW as possible without causing the picture to "bloom".
4. Rotate the Red **(VR801)** and Blue **(VR804)** Cut off controls to maximum CCW position to produce a green raster.
5. Loosen the deflection yoke clamp screw and pull the deflection yoke toward the rear of the CRT.
6. Begin the following adjustment with the tabs on the round purity magnet rings set together, slowly separate the two tabs while at the same time rotating them to adjust for a uniform green stripe at the center of the CRT screen.
7. Carefully slide the deflection yoke forward to achieve green (uniform green screen).
   NOTE: Center purity is obtained by adjusting the tabs on the round purity magnet rings, outer edge purity is obtained by sliding the deflection yoke forward.
8. Check for red and blue field purity by alternately increasing output of Red **(VR801)** and Blue **(VR804)** Cut off controls and touch up adjustments, if required.
9. Tighten deflection yoke clamp screw.



A	B	C
PURITY MAGNETS	4 POLE MAGNETS	6 POLE MAGNETS

Figure 1 Picture Tube Neck Component Location

BLACK AND WHITE TRACKING

The purpose of this procedure is to adjust the bias applied to the picture tube to obtain good black and white picture production at all brightness levels while, at the same time achieving maximum useable brightness. Proper RF AGC control adjustment should have been verified prior to performing this procedure.

1. With antenna connected to the receiver, go to a channel with strong received. Misadjust the fine tuning control so that the receiver will not produce a color picture while the following adjustment are being performed.
2. Rotate the Red **(VR802)** and Blue **(VR805)** Drive control fully CW and then back CCW to the center of their rotation ranges.
3. Rotate the Red **(VR801)** and Blue **(VR804)** Cut off controls to the fully CCW end of their rotation ranges.
4. Set normal-service switch to service position. Adjust the voltage of test point (collector of green output transistor on CRT PCB) to DC128V with brightness control. Voltage measurement should be measured with an oscilloscope.
5. Rotate the screen control to the fully CCW end of its rotation range. Then, rotate it CW until a dim line of one pronounced color (green, red or blue) is obtained.
6. The other two color Cut off controls must be rotated CW until a dim white line is obtained.
7. Set normal-service switch to normal position.
8. If required, touch-up adjustment of the Red **(VR802)** and Blue **(VR805)** Drive controls to produce a uniform monochrome picture.
9. Rotate the brightness and contrast controls fully CCW.
10. Rotate the brightness control CW until a dim raster is obtained.
11. If the screen does not display with uniformity, steps 2 through 10 of this procedure must be repeated.

ALIGNMENT INSTRUCTIONS

STATIC CONVERGENCE ADJUSTMENT

1. Switch the Receiver ON and allow it to warm up for 15 minutes.
2. Connect the output of a Crosshatch Generator to the receiver and, concentrating on the center of the CRT screen, proceed as follows:

a. Locate a pair of 4 pole magnets rings. Rotate individual rings (change spacing between tabs) to converge the vertical red and blue lines. Rotate a pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue lines.

b. After completing red and blue center convergence, locate the pair of 6 pole magnets rings. Rotate individual rings (change spacing between tabs) to converge the vertical red and blue (magenta) and green lines. Rotate a pair of rings (maintaining spacing between tabs) to converge the horizontal red and blue (magenta) and green lines.

DYNAMIC CONVERGENCE ADJUSTMENT

Dynamic convergence (convergence of the three color fields at the edges of the CRT screen) is accomplished by proper insertion and positioning of three rubber wedges between the edge of the deflection yoke and the tunnel of the CRT. This is accomplished in the following manner.

1. Switch the Receiver ON and allow it to warm up for 15 minutes.
2. Apply crosshatch pattern from Dot/Bar Generator to receiver. Observe spacing between lines around edges of CRT screen.
3. Tilt the deflection yoke up or down, and insert tilt adjustment wedges (1) and (2) between the deflection yoke and the CRT until the mis-convergence illustrated in **Figure 2 (A)** has been corrected.
4. Tilt the deflection yoke right and left, and insert tilt adjustment wedge (3) between the deflection yoke and the CRT until the mis-convergence illustrated in **Figure 2 (B)** has been corrected.
5. Alternately change spacing between, and depth of insertion of the three wedges proper dynamic convergence is obtained.
6. Use a strong adhesive tape to firmly secure each of the three wedges to the funnel of the CRT.
7. Check purity and adjust, if necessary.

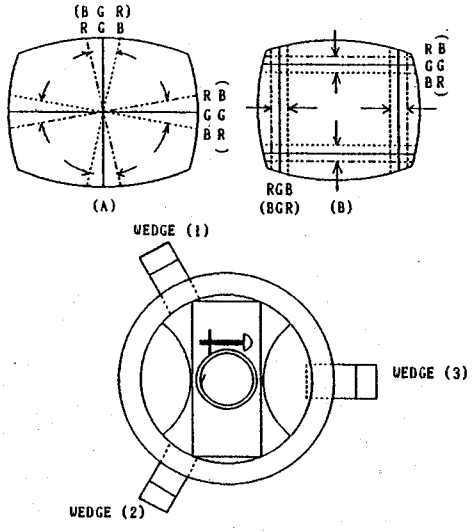


Figure 2 Dynamic Convergence Adjustment

VIDEO IF ALIGNMENT

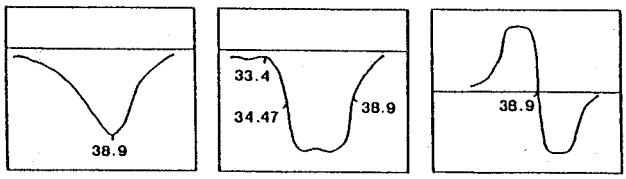
(Refer to Figure 3)

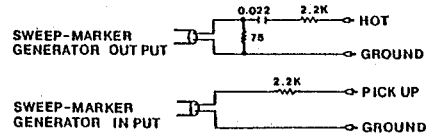
TEST EQUIPMENT CONNECTION

OSCILLOSCOPE .... Set AC-DC switch to AC position.

SWEEP-MARKER GENERATOR .... Connect H SCOPE and V SCOPE output cable from SWEEP-MARKER GENERATOR to H and V input connectors on the OSCILLOSCOPE, connect hot lead of SWEEP-MARKER OUTPUT cable to test point TP1 on PCB001; connect ground lead to chassis ground. Connect pick up SWEEP-MARKER INPUT cable to TP7; ground lead to chassis ground.

1. Connect 10K ohm variable resistor between TP4, B+(12V) to ground.
   Install AGC VR to prevent saturation in waveform, then adjust AGC VR for proper size of waveform. On the other hand, in case IF AGC voltage is supplied externally, adjust for proper size of waveform on condition that IF AGC voltage is within 10V and is gradually decreased.
2. Adjust **L204** to obtain maximum amplitude of response curve at 38.9 MHz.
   (Refer to Response Curve "A")
3. Connect a 100 ohm resistor between TP9 and TP10. Re-connect hot lead of SWEEP-MARKER GENERATOR OUTPUT cable from TP1 to TV tuner TP.
4. Adjust **L206** to obtain maximum amplitude of response curve.
   (Refer to Response Curve "B")
5. Disconnect the 10K ohm variable resistor and 100 ohm resistor from the circuit.
   Disconnect C006. (solder bridge)
6. Connect SWEEP-MARKER GENERATOR INPUT cable from TP7 to TP6.
7. Adjust **L203** to place 38.9 MHz marker at reference line on response curve.
   (Refer to Response Curve "C")
8. Re-connect C006. (solder bridge)





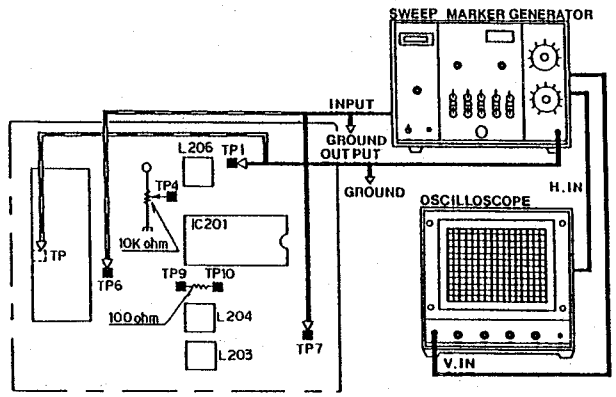
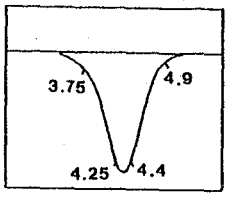


FIGURE 3

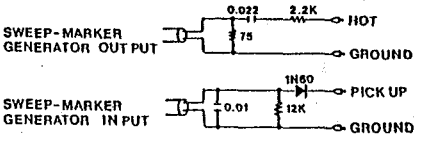
SECAM CHROMA BANDPASS ALIGNMENT

(Refer to Figure 4)
TEST EQUIPMENT CONNECTION
GENERAL ..... PAL-SECAM switch to SECAM position.
SWEEP-MARKER GENERATOR ... Connect H. SCOPE and V. SCOPE output cable from SWEEP-MARKER GENERATOR to H. and V. input connectors on the OSCILLOSCOPE, connect hot lead of SWEEP-MARKER OUTPUT cable to IP on TV tuner; connect ground lead to chassis ground.
Connect pick up lead SWEEP-MARKER INPUT cable to TP15; connect ground lead to TP17.

1. Adjust **L901** to obtain best overall response curve. (Refer to Response Curve "D")



CURVE "D"



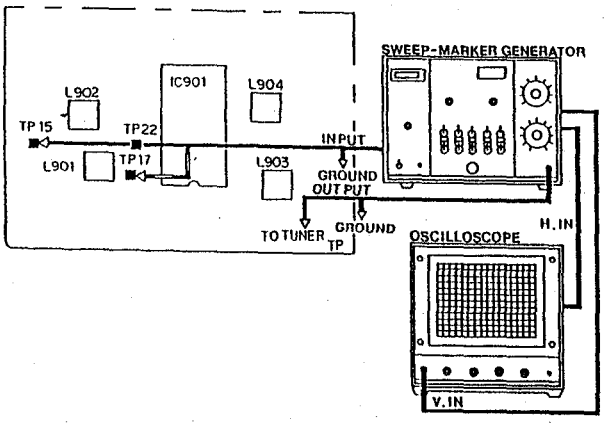


FIGURE 4

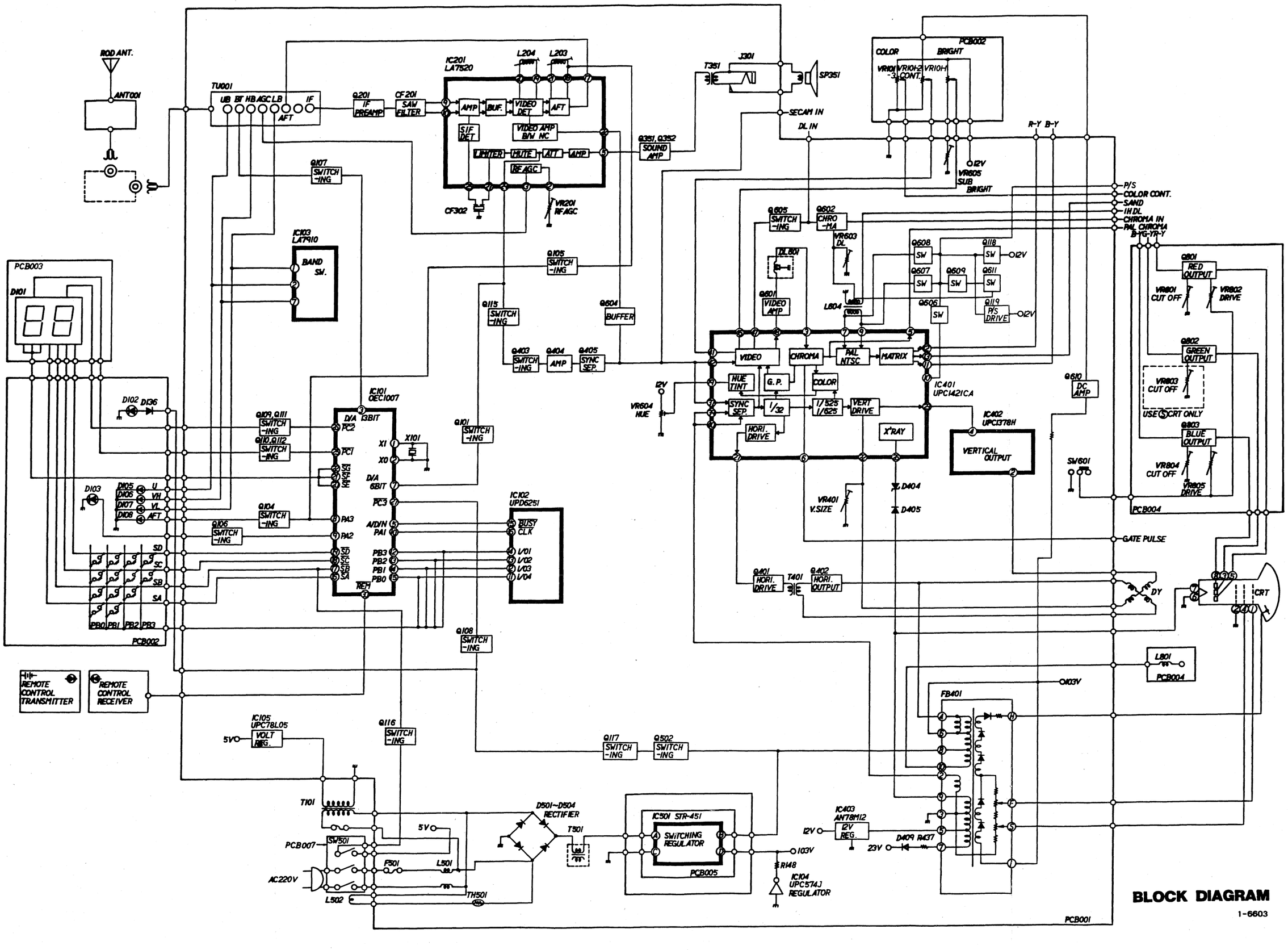
SECAM IDENT ADJUSTMENT

1. Receive the signal of secam color pattern.
2. Connect the oscilloscope to TP22 and ground.
3. Adjust the voltage to maximum with **L902**.

SECAM PHASE ADJUSTMENT

1. Receive the signal of secam color pattern.
2. Adjust **L903** and **L904** not to change the color of gound on the pattern while tuning the Color (VR101-3) control from minimum to maximum position.

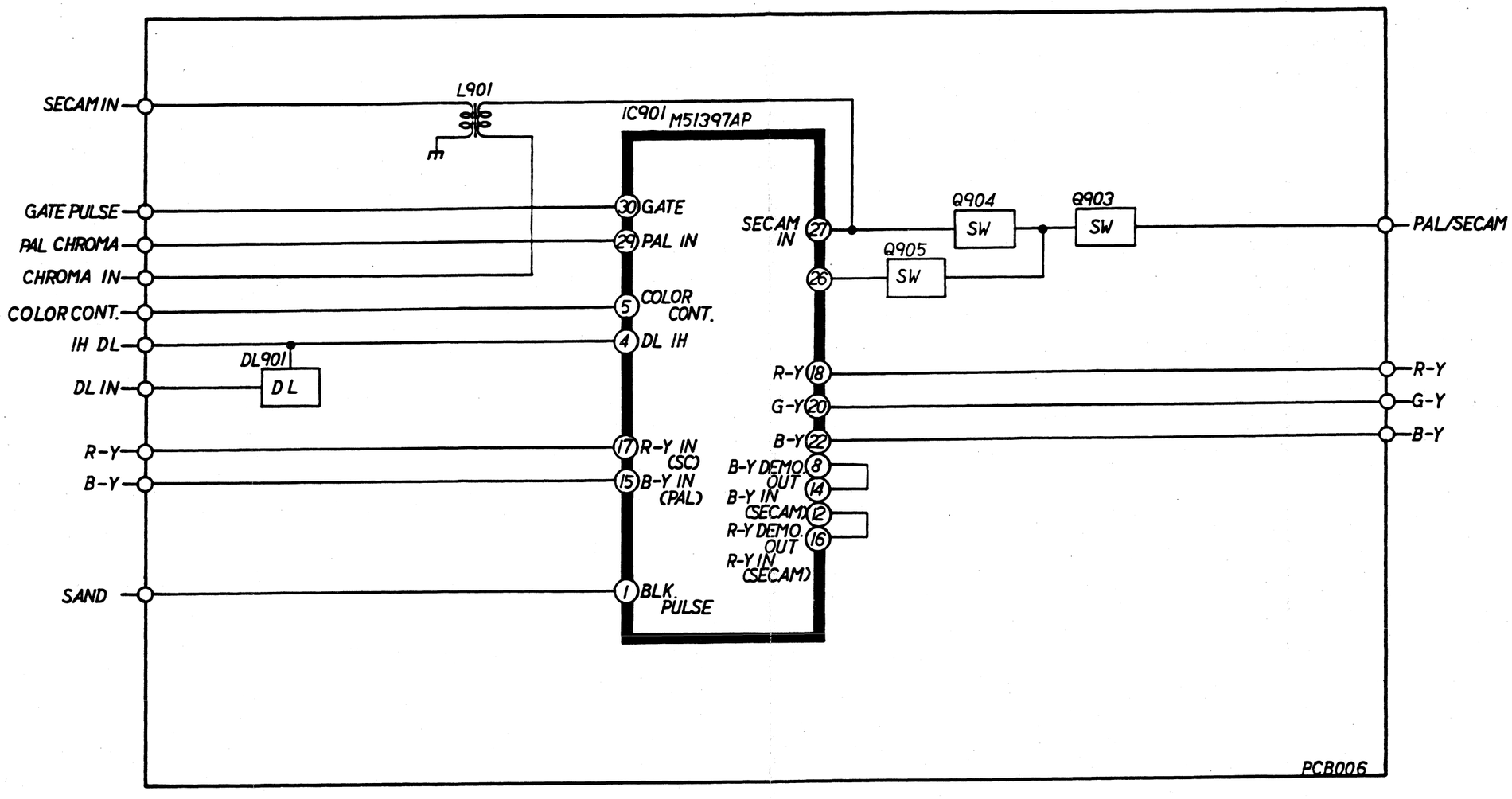
BLOCK DIAGRAM



BLOCK DIAGRAM

1-6603

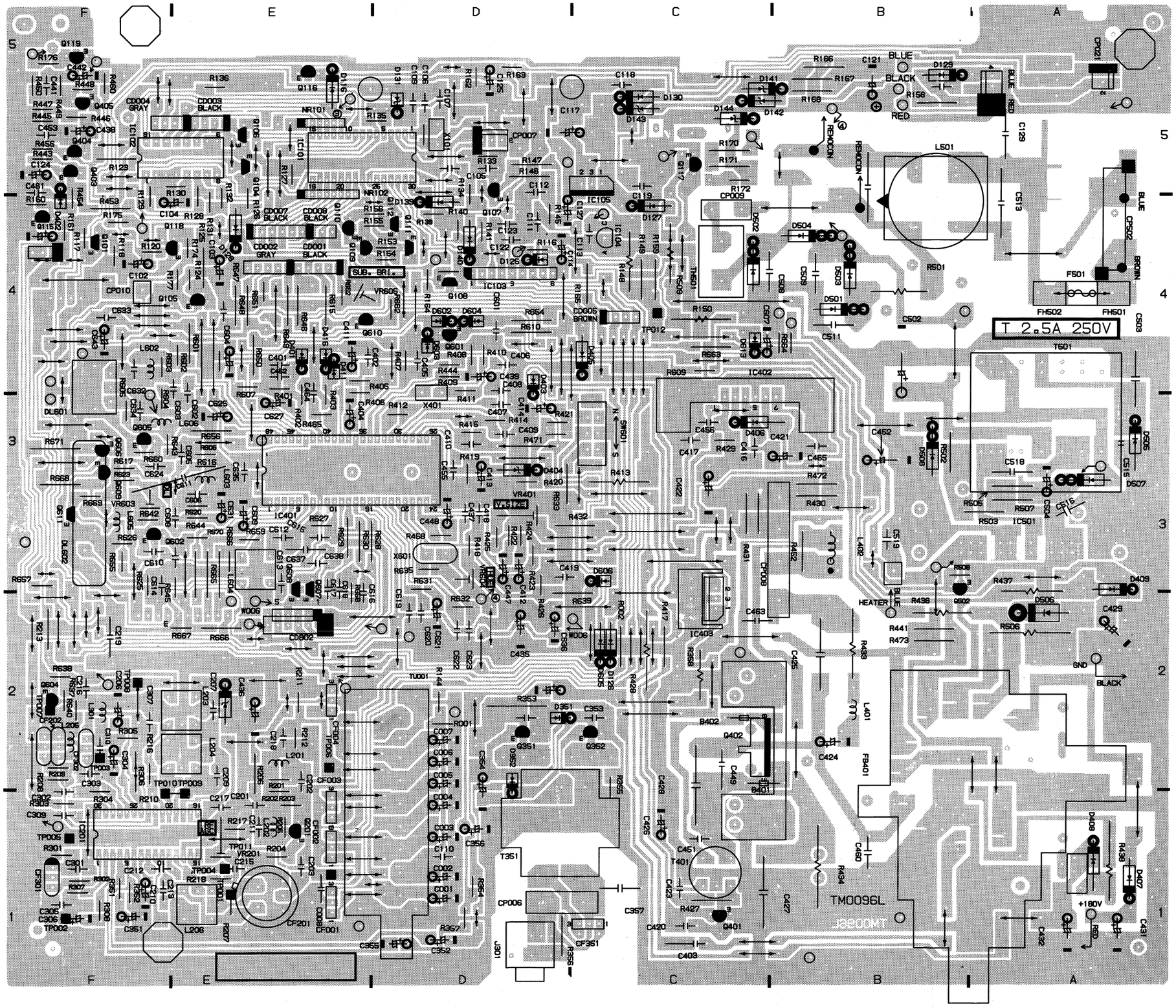
BLOCK DIAGRAM



BLOCK DIAGRAM

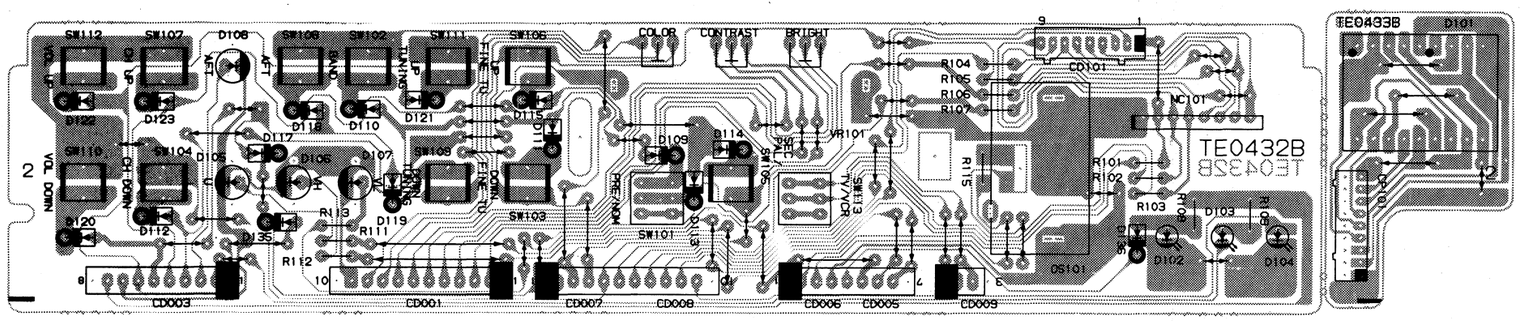
3-2325

MAIN P.C.BOARD

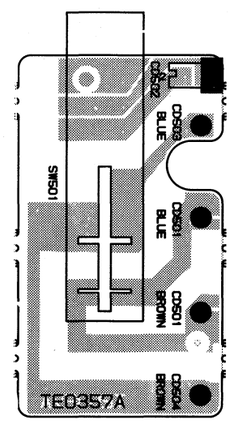


MAIN P.C.BOARD

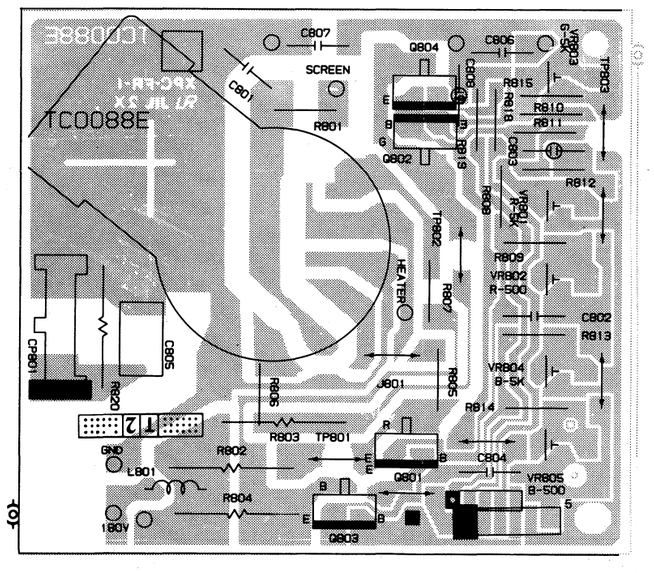
CONTROL P.C.BOARD



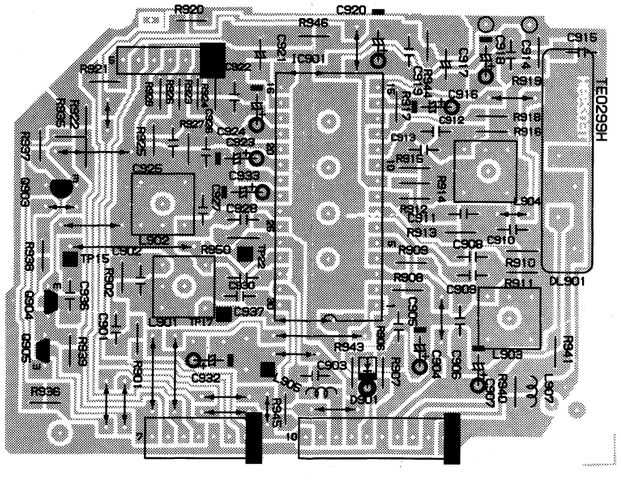
POWER SWITCH P.C.BOARD



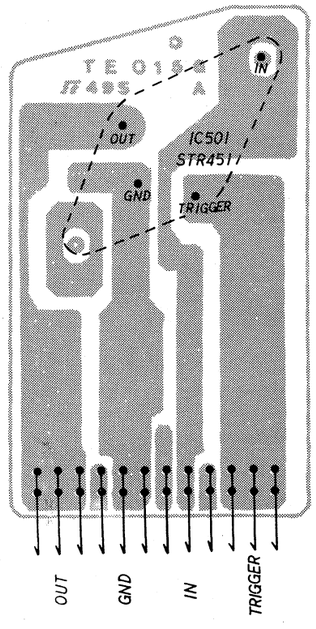
CRT P.C.BOARD



SECAM P.C.BOARD

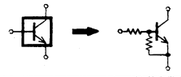


POWER P.C.BOARD

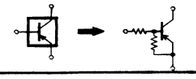


CHASSIS SCHEMATIC DIAGRAM

CAUTION : DIGITAL TRANSISTOR



CAUTION : DIGITAL TRANSISTOR



SW101 PRE/NOR
SW102 BAND SEL.
SW103 FINE TU DW.
SW104 CH DW.
SW105 PAL/SECAM
SW106 FINE TU UP
SW107 CH UP
SW108 AFT
SW109 FAST TU DW.
SW110 VOL DW.
SW111 FAST TU UP
SW112 VOL UP

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY , USE ONES DESCRIBED ON PARTS LIST ONLY.

ATTENTION : LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLES DECRITES DANS LA NOMENCLATURE DES PIECES.

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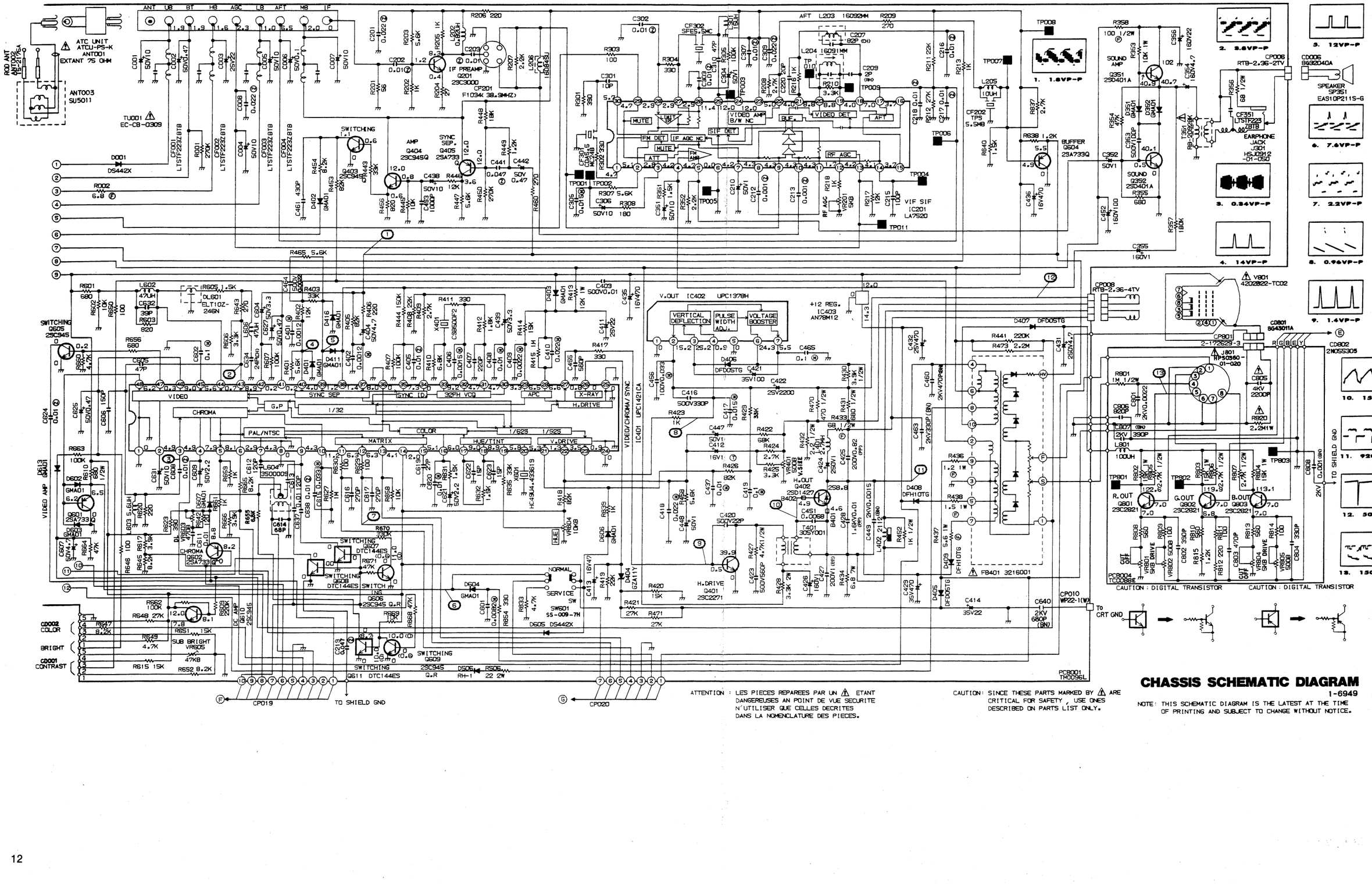
CHASSIS SCHEMATIC DIAGRAM

1-6948

CHASSIS SCHEMATIC DIAGRAM



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CHASSIS SCHEMATIC DIAGRAM

1-6949

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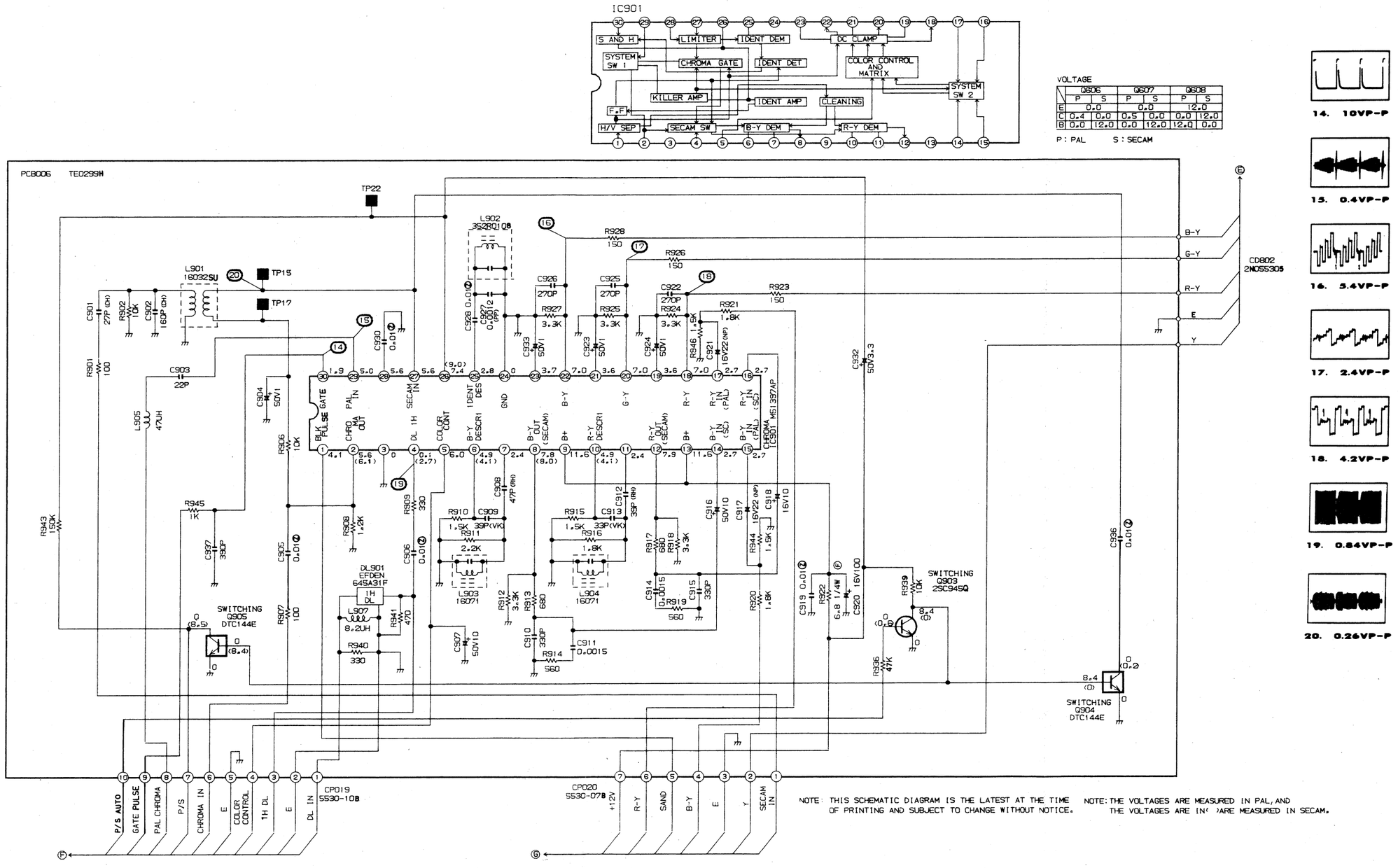
CHASSIS SCHEMATIC DIAGRAM



VOLTAGE

	Q606		Q607		Q608	
	P	S	P	S	P	S
E	0.0		0.0		12.0	
C	0.4	0.0	0.5	0.0	0.0	12.0
B	0.0	12.0	0.0	12.0	12.0	0.0

P : PAL S : SECAM

14. 10VP-P
15. 0.4VP-P
16. 5.4VP-P
17. 2.4VP-P
18. 4.2VP-P
19. 0.84VP-P
20. 0.26VP-P

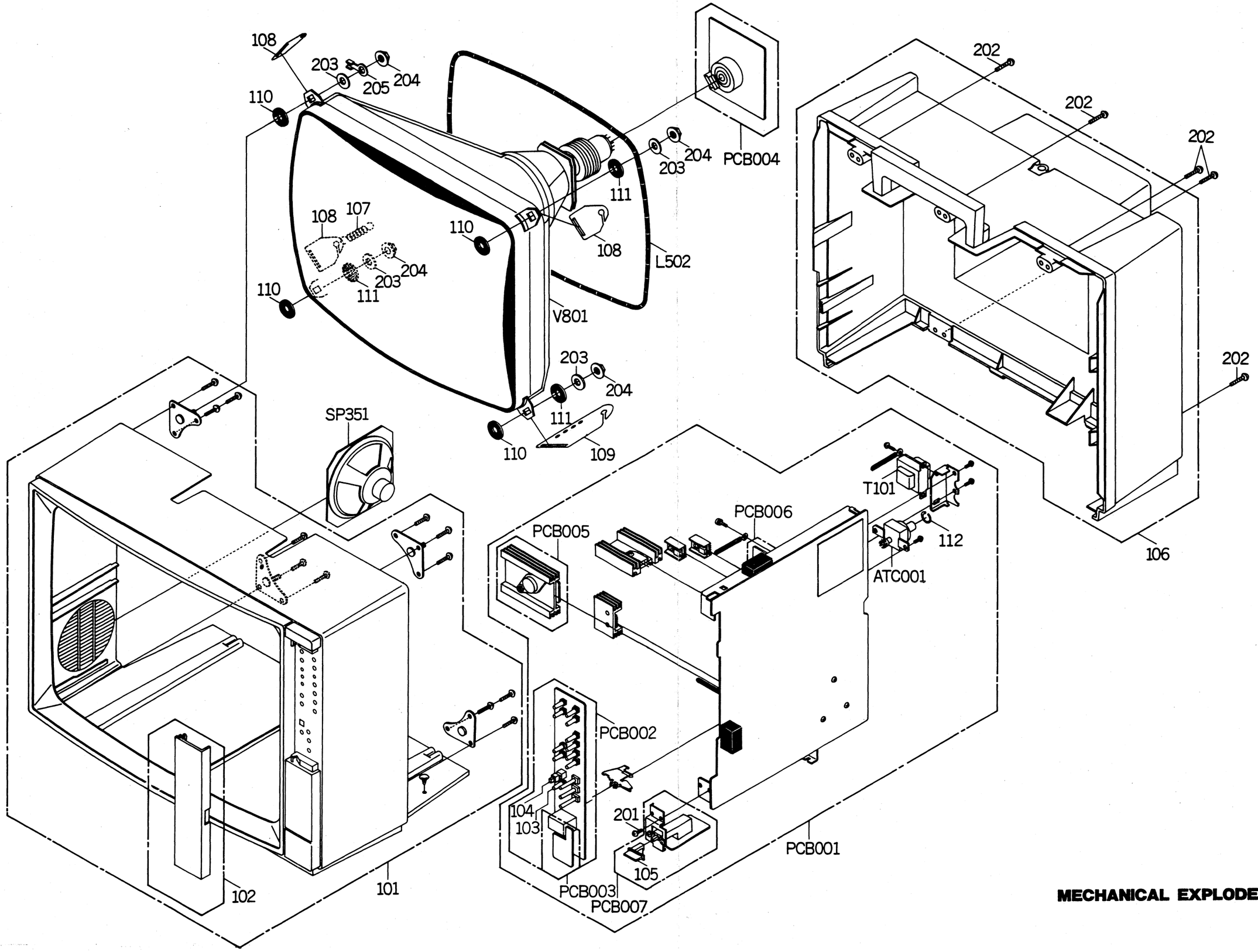
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE VOLTAGES ARE MEASURED IN PAL, AND THE VOLTAGES ARE IN( )ARE MEASURED IN SECAM.

CHASSIS SCHEMATIC DIAGRAM

1-6564

MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW

1-6599

MECHANICAL REPLACEMENT PARTS LIST

REF.NO	PART NO	DESCRIPTION	
101	A35913A723	CABINET,FRONT ASS'Y	
		FRAME,CRT	
102	713KPD0015	DOOR	
103	737KPA0013	BUTTON,CAP	
104	735KPA0027	BUTTON,CHANNEL	
105	736KPA0006	BUTTON,POWER	
106	A35913A743	CABINET,BACK ASS'Y	
		SHEET,RATING	
107	741KUA0023	SPRING,EARTH	
108	751JNA0004	PLATE,EARTH WIRE	
109	751JNA0009	PLATE,EARTH WIRE	
110	800KR00014	SHEET,CRT SUPPORT	
111	800KR00002	SHEET,CRT SUPPORT	
112	749KUA0002	SPRING,ANTENNA	
201	8A07630604	TAP TITE(S) BRAZIER	3*6 CH
202	8A17540A62	TAPPING(BO) TRUSS	4*16 BK
203	8BA60B2161	WASHER	6.3*22*T1.6
204	8300560004	SL NUT	M6
205	901E080000	EARTH LUG(E8)	6.6
---	J1AKTGA02A	GUARANTEE CARD	
---	J1AKTHA01D	INSTRUCTION BOOK	
---	J1AKTHA08D	PTB SHEET	
---	J1AKTHB03B	SCHEMATIC DIAGRAM	
---	791KHA0054	SHEET,LIGHTRON	
---	792KHA0101	PACKAGE,TOP	
---	792KHA0102	PACKAGE,BOTTOM	
---	793KCD0762	GIFT BOX	

THIS ELECTRICAL PARTS LIST IS A STANDARD PART LIST, BUT
INTERCHANGEABLE PARTS MAY BE USED IN THE UNIT.
SEE THE INTERCHANGEABLE PARTS LIST AFTER THE STANDARD PARTS LIST.

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO	PART NO	DESCRIPTION	
		-RESISTORS-	
R002	R615846R8J	R,FUSE	6.8 OHM 1/4W
R148	R31181123J	R,METAL OXIDE	12K OHM 1 W
R158	R61584181J	R,FUSE	180 OHM 1/4W
R353	R31181103J	R,METAL OXIDE	10K OHM 1 W
R358	R61582101J	R,FUSE	100 OHM 1/2W
R413	R31181123J	R,METAL OXIDE	12K OHM 1 W
R428	R3118A332J	R,METAL OXIDE	3.3K OHM 2 W
R433	R61582680J	R,FUSE	68 OHM 1/2W
R434	R5M2CE6R8K	R,CEMENT	6.8 OHM 7 W
R436	R614811R2J	R,FUSE	1.2 OHM 1 W
R437	R615815R6J	R,FUSE	5.6 OHM 1 W
R438	R614811R5J	R,FUSE	1.5 OHM 1 W
R501	R5M2CD5R6K	R,CEMENT	5.6 OHM 5 W
R506	R3118A220J	R,METAL OXIDE	22 OHM 2 W
R509	R31181103J	R,METAL OXIDE	10K OHM 1 W
R661	R0D104102J	RC	1.0K OHM 1/4W
R665	R0D104822J	RC	8.2K OHM 1/4W
R666	R0D108392J	RC	3.9K OHM 1/8W
R671	R0D104473J	RC	47K OHM 1/4W
R802	R31181153J	R,METAL OXIDE	15K OHM 1 W
R803	R31181153J	R,METAL OXIDE	15K OHM 1 W
R804	R31181153J	R,METAL OXIDE	15K OHM 1 W
⚠ R820	R03101225J	RC	2.2M OHM 1 W
R922	R615846R8J	R,FUSE	6.8 OHM 1/4W
		-CAPACITORS-	
C008	C0B0F04H4Z	CC	0.022 UF 50V ZF
C219	C0B0F04Q4Z	CC	0.047 UF 50V ZF
C220	C0B0SL421K	CC	20 PF 50V UK
C356	E0B5FB220M	CE	22 UF 160V
C403	C0B0B0514K	CC	10000 PF 500V B
C422	E0B7F3222M	CE	2200 UF 25V
C424	E0B5FD010M	CE	1 UF 250V
C425	P441F2824J	CMPP	0.82 UF 200V
C427	P441F2105J	CMPP	1 UF 200V
C428	P442F9103J	CMPP	0.01 UF1600V
C429	E0B704471M	CE	470 UF 35V
C431	E0B5FD4R7M	CE	4.7 UF 250V
C449	C01BBN7E3K	CC	0.0015UF 2KV
C452	E0B5FB101M	CE	100 UF 160V
C460	C01BBN7Q2K	CC	0.00047UF 2KV BN
C463	C034BN7L2K	CC	330 PF 2KV BN
C502	E0260H101T	CE	100 UF 400V
C503	P442F9332J	CMPP	0.0033UF1600V
C508	C02FB07H3K	CC	0.0022UF 2KV B
C509	C02FB07H3K	CC	0.0022UF 2KV B
C511	C02FB07H3K	CC	0.0022UF 2KV B
⚠ C513	P4440B474M	CMPP	0.47 UF 250V
C515	C034BN7W2K	CC	820 PF 2KV
C516	C034BN7N2K	CC	390 PF 2KV
C518	C01BBN713K	CC	0.001 UF 2KV BN
C611	C020F0414Z	CC	0.01 UF F
C640	C010BN7U2K	CC	680 PF 2KV BN
C801	C02FB07H3K	CC	0.0022UF 2KV B
⚠ C805	C03FE09H3M	CC	2200 PF 4KV E
C807	C034BN7N2K	CC	390 PF 2KV
C808	C01FBN713K	CC	1000 PF 2KV BN
C918	E0B102100M	CE	10 UF 16V
		-SEMICONDUCTORS-	
D001	D13TDS442X	DIODE,SILICON	DS442X-BT
D101	0040322001	LED DISPLAY	SL-1263H
D102	0021321080	LED	SLP-160C
D103	0021321080	LED	SLP-160C
D104	0021321080	LED	SLP-160C
D105	0021321070	LED	SLP-136B-50
D106	0021321070	LED	SLP-136B-50
D107	0021321070	LED	SLP-136B-50
D108	0021321070	LED	SLP-136B-50
D109	D13TGMA010	DIODE,SILICON	GMA-01-BT
D110	D13TGMA010	DIODE,SILICON	GMA-01-BT
D111	D13TGMA010	DIODE,SILICON	GMA-01-BT
D112	D13TGMA010	DIODE,SILICON	GMA-01-BT
D113	D13TGMA010	DIODE,SILICON	GMA-01-BT
D114	D13TGMA010	DIODE,SILICON	GMA-01-BT
D115	D13TGMA010	DIODE,SILICON	GMA-01-BT
D116	D13TDS442X	DIODE,SILICON	DS442X-BT
D118	D13TGMA010	DIODE,SILICON	GMA-01-BT
D119	D13TGMA010	DIODE,SILICON	GMA-01-BT
D120	D13TGMA010	DIODE,SILICON	GMA-01-BT

REF.NO	PART NO	DESCRIPTION	
		-SEMICONDUCTORS (CONT)-	
D121	D13TGMA010	DIODE,SILICON	GMA-01-BT
D122	D13TGMA010	DIODE,SILICON	GMA-01-BT
D123	D13TGMA010	DIODE,SILICON	GMA-01-BT
D125	D13TGMA010	DIODE,SILICON	GMA-01-BT
D126	D13TDS442X	DIODE,SILICON	DS442X-BT
D127	D25T5566B0	DIODE,RECTIFIER	S5566B
D128	D13TDS442X	DIODE,SILICON	DS442X-BT
D129	D25T5566B0	DIODE,RECTIFIER	S5566B
D130	D25T5566B0	DIODE,RECTIFIER	S5566B
D136	D13TGMA010	DIODE,SILICON	GMA-01-BT
D144	D93T05R10Y	DIODE,ZENER	GZA5.1 Y BT
D351	D13TGMA010	DIODE,SILICON	GMA-01-BT
D352	D13TGMA010	DIODE,SILICON	GMA-01-BT
D401	D13TGMA010	DIODE,SILICON	GMA-01-BT
D402	D13TGMA010	DIODE,SILICON	GMA-01-BT
D403	D13TGMA010	DIODE,SILICON	GMA-01-BT
D404	D93T01100Y	DIODE,ZENER	GZA11 Y BT
D405	D23TFD05TG	DIODE,RECTIFIER	DFD05TG-BT
D406	D23TFD05TG	DIODE,RECTIFIER	DFD05TG-BT
D407	D23TFD05TG	DIODE,RECTIFIER	DFD05TG-BT
D408	D230FH10TG	DIODE,RECTIFIER	DFH10TG
D409	D23FFH10TG	DIODE,RECTIFIER	DFH10TG-KB4
D411	D13TGMA010	DIODE,SILICON	GMA-01-BT
D416	D130GMA010	DIODE,SILICON	GMA-01
⚠ D501	D28020E100	DIODE,SILICON	20E10
⚠ D502	D28020E100	DIODE,SILICON	20E10
⚠ D503	D28020E100	DIODE,SILICON	20E10
⚠ D504	D28020E100	DIODE,SILICON	20E10
D505	D2BF00RU20	DIODE,SILICON	RU-2
D506	D2B000RH10	DIODE,RECTIFIER	RH-1
D507	D2B000RH10	DIODE,RECTIFIER	RH-1
D508	D2B000R2M0	DIODE,AVARANCHE	R2M
D602	D13TGMA010	DIODE,SILICON	GMA-01-BT
D603	D13TGMA010	DIODE,SILICON	GMA-01-BT
D604	D13TGMA010	DIODE,SILICON	GMA-01-BT
D605	D13TDS442X	DIODE,SILICON	DS442X-BT
D606	D13TGMA010	DIODE,SILICON	GMA-01-BT
D607	D13TGMA010	DIODE,SILICON	GMA-01-BT
D613	D13TGMA010	DIODE,SILICON	GMA-01-BT
IC101	I52D010070	IC	OEC1007
IC102	I32D062510	IC	UPD6251C
IC103	I03S079100	IC	LA7910
IC104	I02190574J	IC	UPC574J-T
IC105	I02A98L050	IC	UPC78L05
IC201	I03DE75200	IC	LA7520
IC401	I02DE1421A	IC	UPC1421CA
IC402	I02SD13780	IC	UPC1378H
IC403	I01A98M120	IC	AN78M12
⚠ IC501	I2B3904510	IC	STR-451
IC901	I06DC13970	IC	M51397AP
Q101	TP7TB03001	COMPOUND TRANSISTOR	DTA114E S-T
Q104	TN7TG03001	COMPOUND TRANSISTOR	DTC124X S-T
Q105	TC2T009450	TRANSISTOR,SILICON	2SC945-T
Q106	TN7TG03001	COMPOUND TRANSISTOR	DTC124X S-T
Q107	TC2T009450	TRANSISTOR,SILICON	2SC945-T
Q108	TN7TB03001	COMPOUND TRANSISTOR	DTC114E S-T
Q109	TA2T009520	TRANSISTOR,SILICON	2SA952-T
Q110	TA2T009520	TRANSISTOR,SILICON	2SA952-T
Q111	TN7TF03001	COMPOUND TRANSISTOR	DTC114Y S-T
Q112	TN7TF03001	COMPOUND TRANSISTOR	DTC114Y S-T
Q115	TC2T009450	TRANSISTOR,SILICON	2SC945-T
Q116	TC2T009450	TRANSISTOR,SILICON	2SC945-T
Q117	TC3F02909S	TRANSISTOR,SILICON	2SC2909S
Q118	TC2T009450	TRANSISTOR,SILICON	2SC945-T
Q119	TC2T009450	TRANSISTOR,SILICON	2SC945-T
Q201	TC3T030000	TRANSISTOR,SILICON	2SC3000-AA
Q351	TD200401A0	TRANSISTOR,SILICON	2SD401A
Q352	TD200401A0	TRANSISTOR,SILICON	2SD401A
Q401	TC3T022710	TRANSISTOR,SILICON	2SC2271-AE
Q402	TD5F014270	TRANSISTOR,SILICON	2SD1427
Q403	TC2T00945Q	TRANSISTOR,SILICON	2SC945QT
Q404	TC2T00945Q	TRANSISTOR,SILICON	2SC945QT
Q405	TA2T00733Q	TRANSISTOR,SILICON	2SA733QT
Q502	TB3T00698E	TRANSISTOR,SILICON	2SB698E-AA
Q601	TA2T00733Q	TRANSISTOR,SILICON	2SA733QT
Q602	TA2T00733Q	TRANSISTOR,SILICON	2SA733QT
Q604	TA2T00733Q	TRANSISTOR,SILICON	2SA733QT
Q605	TC2T009450	TRANSISTOR,SILICON	2SC945-T
Q606	TC2T00945Q	TRANSISTOR,SILICON	2SC945QT
Q607	TN7TD03001	COMPOUND TRANSISTOR	DTC144E S-T
Q608	TN7TD03001	COMPOUND TRANSISTOR	DTC144E S-T
Q609	TC2T00945Q	TRANSISTOR,SILICON	2SC945QT
Q610	TC2T009450	TRANSISTOR,SILICON	2SC945-T

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO	PART NO	DESCRIPTION	
		-SEMICONDUCTORS (CONT)-	
Q611	TN7TD03001	COMPOUND TRANSISTOR	DTC144E S-T
Q801	TC3F026210	TRANSISTOR,SILICON	2SC2621
Q802	TC3F026210	TRANSISTOR,SILICON	2SC2621
Q803	TC3F026210	TRANSISTOR,SILICON	2SC2621
Q903	TC2T00945Q	TRANSISTOR,SILICON	2SC945QT
Q904	TN7TD03001	COMPOUND TRANSISTOR	DTC144E S-T
Q905	TN7TD03001	COMPOUND TRANSISTOR	DTC144E S-T
		- COILS & TRANSFORMERS-	
L202	021673R82M	COIL EL0606RA-R82M	0.82 UH
L203	033602002F	COIL,VIDEO IFT	16092MM
L204	033500005F	COIL,VIDEO IFT	16091MM
L205	021673100K	COIL EL0606RA-100K	10 UH
L206	033500001G	COIL,VIDEO IFT	16084SU
L301	021673150K	COIL EL0606RA-150K	15 UH
L401	021679272K	COIL EL0909RR-272K	2.7 MH
L402	0221000012	COIL,LINEARITY	21000012
⚠ L501	0291000002	COIL,LINE FILTER	91000002
⚠ L502	028Y160003	COIL,DEGAUSS	8Y160003
L602	021673470K	COIL EL0606RA-470K	47 UH
L603	0216735R6K	COIL EL0606RA-5R6K	5.6 UH
L604	033500009G	COIL,MATCHING	3500009
L606	021673470K	COIL EL0606RA-470K	47 UH
L801	021JA2101K	COIL LAL03TA101K	100 UH
L901	03302R001G	COIL,CHROMA	16032SU
L902	03352R010G	COIL,CHROMA	352R0108
L903	03352R006G	COIL,CHROMA	16071
L904	03352R006G	COIL,CHROMA	16071
L905	021JA6470K	COIL LAL02TA470K	47 UH
L907	0216738R2K	COIL EL0606RA-8R2K	8.2 UH
⚠ T101	040511007E	TRANSFORMER,POWER AC	0511007
⚠ T351	045284001E	TRANSFORMER,POWER AC	RB-20928K
T401	03305Y001G	TRANS,HORIZONTAL DRIVE	305Y001
T501	0481330015	TRANSFORMER,SWITCHING	RB-20855
		-JACKS-	
J301	0602101004	JACK,RCA 3.5	HSJ0912-01-050
⚠ J801	0662130007	SOCKET,CRT	HPS0360-01-020
		-SWITCHES-	
SW101	0501201007	SWITCH,PUSH	SPPH11280A
SW102	0504211004	SWITCH,TACT	SKHHAN012A
SW103	0504211004	SWITCH,TACT	SKHHAN012A
SW104	0504211004	SWITCH,TACT	SKHHAN012A
SW105	0504211004	SWITCH,TACT	SKHHAN012A
SW106	0504211004	SWITCH,TACT	SKHHAN012A
SW107	0504211004	SWITCH,TACT	SKHHAN012A
SW108	0504211004	SWITCH,TACT	SKHHAN012A
SW109	0504211004	SWITCH,TACT	SKHHAN012A
SW110	0504211004	SWITCH,TACT	SKHHAN012A
SW111	0504211004	SWITCH,TACT	SKHHAN012A
SW112	0504211004	SWITCH,TACT	SKHHAN012A
⚠ SW501	0530102008	SWITCH,PUSH	ESB-76937A
SW601	0510422001	SWITCH,SLIDE	SS-009-7H
		-VARIABLE RESISTORS-	
VR101	V029300007	VR,ROTARY	RK09Z3330012
VR201	V115353B02	VR,SEMIFIXED	EVN-52JA00B53
VR401	V115352B02	VR,SEMIFIXED	EVN-52JA00B52
VR603	V1263Q2B01	VR,SEMIFIXED	RHEOAS20FB (H0615C105)
VR604	V126314B01	VR,SEMIFIXED	RHEOA140FB (H0615C113)
VR605	V1263Q4B01	VR,SEMIFIXED	RHEOAS40CA (H0615C117)
VR801	V175C53B01	VR,SEMIFIXED	RVA0911H304-1-502M
VR802	V175C52B01	VR,SEMIFIXED	RVA0911H304-1-501M
VR804	V175C53B03	VR,SEMIFIXED	RVA0911H304-3-502M
VR805	V175C52B03	VR,SEMIFIXED	RVA0911H304-3-501M
		-P.C. BOARDS ASS'Y-	
PCB001	A35913A010S	PCB ASS'Y	TM0096L-S
PCB002	A35913A030	PCB ASS'Y	TE0432B
PCB003	A35913A200	PCB ASS'Y	TE0433B
PCB004	A35913A110	PCB ASS'Y	TC0088E
PCB005	A35913A020	PCB ASS'Y	TE0156A
PCB006	A35913A140	PCB ASS'Y	TE0299H
PCB007	A35913A340	PCB ASS'Y	TE0357A
		-MISCELLANEOUS-	
⚠ ANT001	0637300001	ATC UNIT	ATCU-PS-K
ANT002	1251110013	ANTENNA,ROD	T5-2175A
ANT003	023V000003	COIL,BALUN	SU5011
B401	0246451652	CORE,BEADS	BF25-4.5*5*1.6
B402	0246451652	CORE,BEADS	BF25-4.5*5*1.6
BT101	141T004003	BATTERY,MANGAN	UM-4

REF.NO	PART NO	DESCRIPTION	
		-MISCELLANEOUS (CONT)-	
BT102	141T004003	BATTERY,MANGAN	UM-4
CD001	1224051201	CORD,JUMPER	24051201
CD002	1224051202	CORD,JUMPER	24051202
CD003	1224041204	CORD,JUMPER	24041204
CD004	1224041202	CORD,JUMPER	24041202
CD005	1224041402	CORD,JUMPER	24041402
CD006	068G32040A	CORD,CONNECTOR	8G32040A
CD007	1224061501	CORD,JUMPER	24061501
CD008	1224031501	CORD,JUMPER	24031501
CD010	1224031101	CORD,JUMPER	24031101
CD101	0694290080	CONNECTOR PCB SIDE	174074-9
⚠ CD501	120S451003	CORD,AC	120S451003
CD502	068G12183A	CORD,JUMPER	8G12183A
CD503	068G01173A	CORD,CONNECTOR	8G01173A
CD504	068G01174A	CORD,CONNECTOR	8G01174A
CD801	068G43011A	CORD,EIS CONNECTOR	8G43011A
CD802	122N055305	CORD,JUMPER	2N055305
CF001	116F3TH4Z1	FILTER,EMI	LTSTF223ZBTB
CF002	116F3TH4Z1	FILTER,EMI	LTSTF223ZBTB
CF003	116F3TH4Z1	FILTER,EMI	LTSTF223ZBTB
CF004	116F3TH4Z1	FILTER,EMI	LTSTF223ZBTB
CF201	1027038R91	FILTER,SAW	F1034
CF202	1012105R51	FILTER,CERAMIC TRAP	TPS5.5MB
CF301	101225R501	FILTER,CERAMIC	CDA5.5MC24B
CF302	1012005R52	FILTER,CERAMIC	SFE5.5MC
CF351	116F3TH4Z1	FILTER,EMI	LTSTF223ZBTB
CP006	069Z320018	CONNECTOR PCB SIDE	RTB-2.36-2TV
CP008	069Z340018	CONNECTOR PCB SIDE	RTB-2.36-4TV
CP009	069Z320029	CONNECTOR PCB SIDE	TV-50P-02-V1
CP010	0695010049	CONNECTOR PCB SIDE	WP22-1(W)
CP012	0694FC0010	F-CHIP	1-163740-1
CP019	069RFA0040	CONNECTOR PIN	5530-10B
CP020	069RF70040	CONNECTOR PIN	5530-07B
CP101	0694290090	CONNECTOR PCB SIDE	174161-9
CP801	0694430100	CONNECTOR	2-172629-3
CP802	0675105019	WIRE HOLDER	WH5D-1
CP803	0675105019	WIRE HOLDER	WH5D-1
DL601	1031000601	DELAY	ELT-10Z246N
DL901	104114R43G	DELAY LINE GLASS	EFDEN645A31F
EAR351	074J130001	EARPHONE	3.5FAI,3M,16 OHM
⚠ F501	0808T2R502	FUSE	EAK2.5 A(T) 250V
⚠ FB401	0432160011	TRANSFORMER,FLYBACK	3216001
FH501	067H000003	HOLDER,FUSE	773JEE0004
FH502	067H000003	HOLDER,FUSE	773JEE0004
MS001	128F000003	MICA,SHEET	1S-3MPC
M[illegible]	128B000016	MICA,SHEET	TO-3(5)
[illegible]	110E447301	R,NETWORK	RN3H5A473J01A
	110E747301	R,NETWORK	RN3H8A473J01A
[illegible]	077M006004	REMOTE RECEIVER	KEY-C00SV2
S001	128F100005	SPACER	BUSH-T
S002	128F100005	SPACER	BUSH-T
SP351	070G043001	SPEAKER	EAS-10P211SG
TH501	D810M180H0	DEGAUSS ELEMENT	ERP-F5B0M180H
TM101	076G092009	TRANSMITTER	EUR-53724
⚠ TU001	0145211003	TUNER,UHF-VHF	EC-CB-0309
⚠ V801	098F160403	TUBE,CATHODE RAY	4202B22-TC02
X101	10024R5002	CERAMIC,OSCILLATOR	CSA4.50MG
X401	1002R50002	CERAMIC,OSCILLATOR	CSB500F2
X601	100H4R4306	CRYSTAL	HC49/U 4.433619MHZ

RESISTOR
RC.....CARBON RESISTOR

CAPACITORS
CC.....CERAMIC CAPACITOR
CE.....ALUMI ELECTROLYTIC CAPACITOR
CP.....POLYESTER CAPACITOR
CPP.....POLYPROPYLENE CAPACITOR
CPL.....PLASTIC CAPACITOR
CMP.....METAL POLYESTER CAPACITOR
CMPL.....METAL PLASTIC CAPACITOR
CMPP.....METAL POLYPROPYLENE CAPACITOR
CST.....STYROL CAPACITOR

INTERCHANGEABLE PARTS LIST

NOTE:THE FOLLOWING PART(S) MAY BE SUBSTITUTED FOR PARTS INDICATED IN THE BASIC PART(S) LIST(WITH THE SAME REF.NO.). THESE PARTS SHARE THE SAME ELECTRICAL CHARACTERISTICS AND OTHER ELEMENTS FOR COMMON USAGE. EITHER PART NUMBER MAY BE USED IN THIS UNIT.

REF.NO	DESCRIPTION (PART NO)	DESCRIPTION (PART NO)
T501	RB-20855 (0481330015)	8133010T (048133010T)
X601	HC49/U 4.433619MHZ (100H4R4306)	HC-49/U 4433.619KHZ (10064R4306)